

# **ROBBINS** CROSSOVER SERIES XSE (EPB/SLURRY HYBRID)

## ABOUT

If the geology of your project includes high permeability soils combined with sections of low permeability ground, the Crossover XSE is the solution for you.

Not all projects fit within the parameters of specific TBM types, and at Robbins we believe that your machine should be custom-engineered for your unique project requirements. That's where the Crossover Series of TBMs comes in.

The Robbins XSE TBM employs design elements from both EPB and Slurry machines, and is the most versatile of any TBM type. Contractors can choose from slurry piping to screw conveyors to machine belt conveyors, or all of the above, for muck removal.

## HOW THEY WORK

### In EPB Mode

In low permeability soils without high hydrostatic pressures, the XSE can advance quickly and efficiently in EPB mode without the expense and complication of slurry-based muck handling. While in EPB mode, any slurry treatment plant on site can be simplified and more economical. In EPB mode the machine utilizes a screw conveyor to maintain face pressure and remove muck. Because there is no slurry at the excavation face, pressure control is safer and any over-excavation is immediately apparent.

### In Slurry Mode

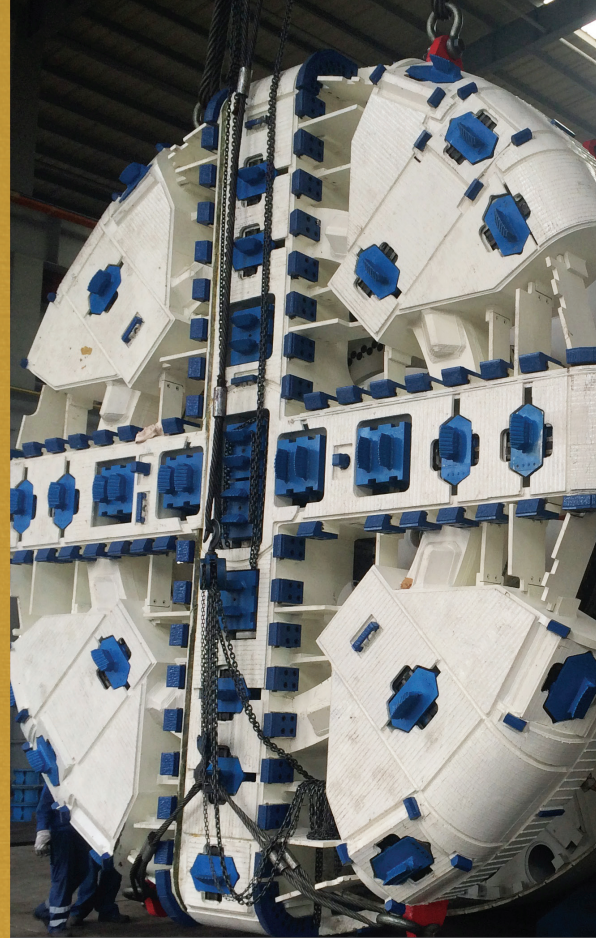
In high permeability soils and areas with high hydrostatic pressures, the XSE can run in slurry mode, thereby eliminating the problems of inaccurate volume monitoring and pressure control that EPBs encounter in these conditions. In slurry mode muck empties into a completely enclosed slurry box. Boulders are broken up using a crushing mechanism in the box, while small cobbles are capable of passing through the slurry pipes.

## BEST TBM DESIGN FOR

- Mixed geology where a highly versatile solution is required
- Urban environments where pinpoint settlement control is needed
- Sections of high permeability soils and high hydrostatic pressures combined with sections of low permeability

## DESIGN OPTIONS

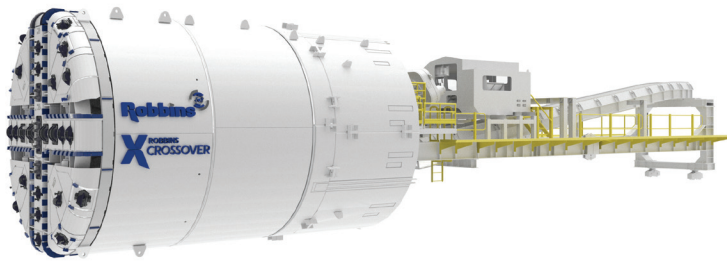
- High-pressure man lock for cutterhead inspection and changes
- Abrasion resistant plating on screw conveyor, casing, and slurry piping
- Easily replaceable slurry pipe sections and screw conveyor flights for abrasive wear
- Multi-speed gearboxes to enable the machine to advance through blocky, fractured, or mixed ground
- Ultra-high emergency thrust system
- Abrasion-resistant wear plating and wear detection on cutterhead
- Automatic guidance system
- Cutter wear monitoring systems
- Disc cutters can be removed and replaced with soft ground tooling
- Single-part or two-part (A+B) liquid back-filling for limitation of settlement



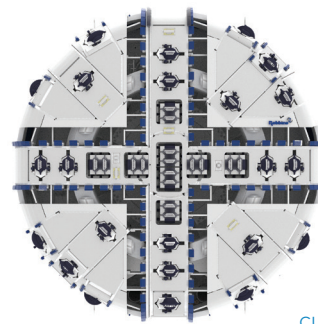
An XSE TBM with customized cutterhead designed for mixed ground conditions.



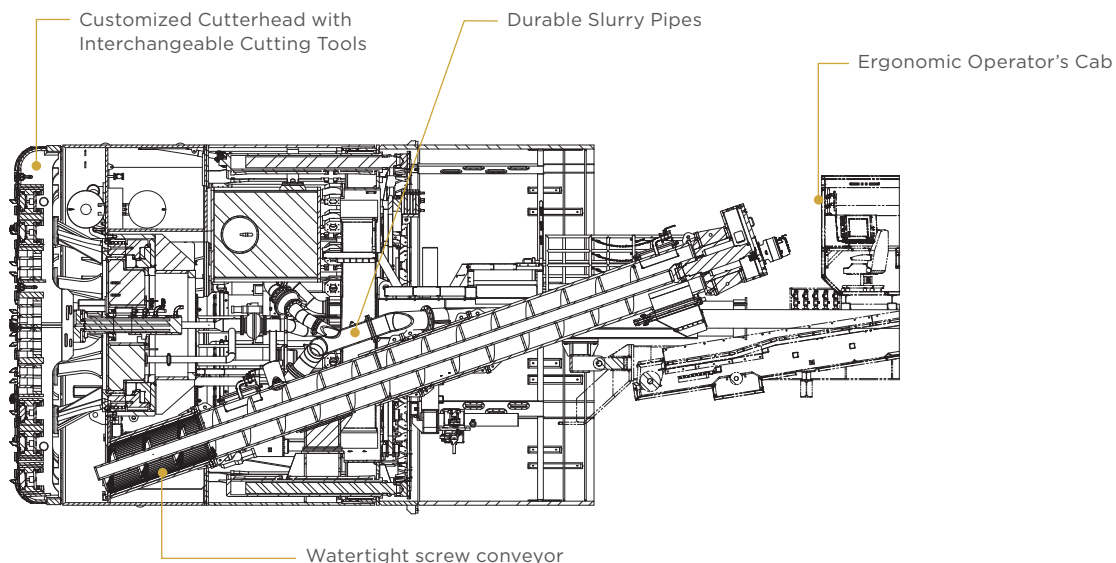
The XSE TBM combines design elements of both EPB and Slurry TBMs.



SIDE VIEW



CUTTERHEAD FOR MIXED  
GROUND CONDITIONS



## MAIN FEATURES: ROBBINS XSE TBM

- Uniquely designed and optimized towards the project geology
- High-capacity main bearing and seal system
- Smooth-flow cutterhead with removable plating
- High-pressure seals to prevent water inflow
- High-speed rotary segment erector
- Durable screw conveyor interchangeable with an installed slurry system depending on geologic conditions

## WHY CHOOSE AN XSE?

- If your tunnel does not consist entirely of high permeability soils, then the XSE is a solution that does not require costly slurry tunneling for the entire tunnel length
- Save time and money in low permeability sections by running the XSE in EPB mode, which does not require a full slurry separation plant
- In high permeability sections, switch to slurry mode to ensure accurate volume monitoring and pressure control in these conditions
- Get the best features of two machines with one machine order, and a versatile solution that could be used on multiple projects with variable ground



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